AFRICAN UNION
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FOR ANIMAL RESOURCES

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CROSSBREEDING: PANACEA OR CURSE TO AFRICAN ANIMAL GENETIC RESOURCES IMPROVEMENT?

Policy Brief: 5

KEY MESSAGE

- *Well planned systematic crossbreeding programs with defined end products can be an opportunity for an economically viable use of the purebred local parental breed.*

INTRODUCTION

Despite the increasing reliance on livestock of exotic origins to provide a substantial proportion of the local production, several analysis suggest that in view of the huge populations of indigenous AnGR they would continue play significant roles in providing products to feed the growing African human populations. Indigenous AnGR are perceived to be poor producers compared to the commercial breeds. Regardless of their reputation as a reliable food and economic resource, the production of indigenous AnGR is not structured enough to enhance their commercialisation. Based on performance of crossbred animals under various field conditions not everyone is convinced of the usefulness of the practice of crossbreeding, and actually argue against its implementation in several situations. The critics to crossbreeding go on to pronounce that imported exotic breeds are not suitable for local environment, as these often large size animals need large quantities of top quality inputs and high calibre management in order to have adequate production and as such are not always best fitted to many African environments. They further point to the many failures of crossbreeding in Africa, and that crossbreeding has in many instances led to the loss of few breeds of AnGR and to a large extent, the collapse of self-sustaining traditional production systems. To these critics crossbreeding is indeed a curse to AnGR management in Africa. Others argue that crossbreeding has had great success in terms of improving the production potential of indigenous AnGR breeds. They point to success stories for crossbreeding programs in African countries that possess good infrastructure and where management of animals is optimal.

There seems to be agreement on the point that if executed indiscriminately, crossbreeding is a great threat to animal genetic diversity. On this recognition, there is growing support for strategies for breed conservation and improvement that avoid inappropriate breed dilution or replacement.

POLICY RELATED ISSUES

Among issues raised concerning crossbreeding involving exotic breeds and local AnGR are:

- The unsuitable design of crossbreeding programs. Due to the resource limitations, the feed unavailability and quality, the geographical locations and seasons, the demand on animals that are better able to adapt to the ever-changing environment due climate

change, crossbreeding programs have not been well designed in several instances. Moreover, many countries, under pressure to achieve food security, are attempting to genetically improve their local breeds of livestock with exotic germplasm, or replace them with exotic breeds, without the comprehensive assessments and supporting data and information necessary to plan sustainable development.

- There is a lack of information available on the status of the national genetic improvement programs that could guide policy makers, development planners and breeders to redesign appropriate crossbreeding programs that respond to the current scenarios.
- AnGR are being eroded as traditional agricultural systems are being rapidly transformed toward more external input-oriented systems, by using exotic AnGR. Crossbreeding changes specific adaptation traits like disease resistance and heat tolerance. It also changes the nature of animal products in such a way that they no longer meet the requirements of consumers, or change the ability of the animals to perform required functions.
- Many crossbreeding programs based on AI have lacked long-term strategies on how to maintain a suitable exotic blood level. Crossbreeding programs, unfortunately, were not based on a clearly defined breeding policy with regard to the level of exotic inheritance and the type of breed to be used. Upgrading to high levels of exotic blood in an environment that cannot support such animals, mainly results in decline of productivity.
- New reproductive and molecular genetic technologies may lead to more effective crossbreeding programs. The new technologies create opportunities to exchange sexed semen between countries. Consequently, trade in AnGR has been affected by the easier trade in global semen. Easier access to these genetic materials is having an impact on the local AI industry where the majority of the donors at particular stations are related to global donors.
- Introduction of exotic breeds leads to higher production cost (inputs). A high initial investment demand is the first threshold to be crossed when introducing crossbreeding. Crossbreeding requires an increase of inputs in health service, mating service, improved nutrition, shelter provision, and therefore results in higher workload and investment costs.
- A technology shift like introduction of crossbreeding transforms livestock farmers from traditional livestock keepers to owners of commercial operations and from ethnic groups with traditional livestock knowledge to less experienced farmers indicating the socio-cultural transition induced by crossbreeding introduction.
- The non-existence or inadequate implementation of the legislations controlling the process of introducing exotic breeds and crossbreeding: It is evident that due to the lack or inadequate implementation of policies and legislation on AnGR, considerable indiscriminate and haphazard crossbreeding has occurred.
- The lack of targeted policies and legislation or the enforcement of these policies and legislations on the management of AnGR in most African countries, is one of the

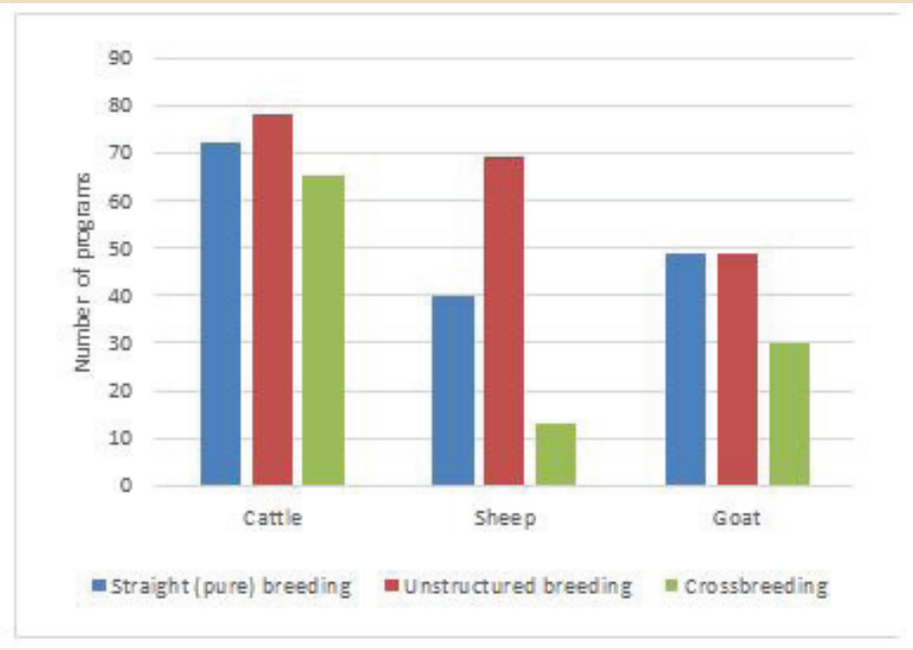
most limiting factors affecting this sector and has resulted in many African countries losing valuable AnGR particularly through indiscriminate crossbreeding and haphazard breeding strategies.

LESSONS LEARNT ON PREFERENCES FOR CROSSBREEDING AND PERCEPTIONS ABOUT THE PERFORMANCE OF CROSSBREDS IN AFRICA

In 2014/2015, AU-IBAR undertook a study among 42 of the AU countries on the status and development of their AnGR. The Study was part of a broader programme whose goal was to get African countries to be effectively involved in the sustainable utilization of AnGR, and to carry out their functions in ways that ensure food security and improved livelihoods. As part of the study, information was sought on:

Enumeration of breeds within species subjected to various breeding schemes, including crossbreeding

The summary of the information showed that in 2015, in Africa, for cattle 30.2% of all breeding improvement programs was done through crossbreeding. 10.6% crossbreeding programs for sheep and 32.6% breeding programs for goat.



Main reasons for crossbreeding for the various species

Of all the types of livestock improvement programs, the ones that cross (mate) local and exotic breeds (crossbreeding) seemed to be the one mentioned to have suffered failures in the past, and yet continues to be pursued with vigour in Africa. According to the results from the study the main reasons adduced by institutions in countries for crossbreeding among local and exotic breeds were for general improvement in meat and milk production, and in few cases, for egg production. Often the local breeds were deemed

to have poor meat production, and/or milk production. For example, for cattle, 21 of 33 countries (64%) which responded to the question stated that improvement sought for crossbreeding was mainly meat, 63% stated it was mainly for milk while nearly 100% in a group of 25 countries reported both growth rate and milk production were the major reason. Most of the systems utilizing crossbreeding among small ruminants sought to produce dual-purpose animals.

Noticeable impacts of crossbreeding

Among the thirty-four (34) countries that provided information on the impact of crossbreeding, a vast majority (30) or 88% of countries reported positive impacts. However, among 29 countries 13 or 45% reported of negative impacts. The drive to crossbreeding AnGR with exotic animals appeared to have been fuelled by the large number of countries who reported to have realized positive impacts from previous crossbreeding programs. Beyond the impact of crossbreeding, negative or positive, there was a general consensus among countries that crossbreeding as a livestock breeding practice is one of the high threat to local AnGR. In the Study, 38 out of 42 (81%) countries identified crossbreeding as a primary threat associated with loss of breed numbers or diversity in their countries. Although crossbreeding as an approach to improve productivity of indigenous breeds in Africa has suffered some setbacks in past as was alluded to by some countries, the practice is still given a lot of priority in countries, as various objectives being sought such as general improvement in meat and milk production were deemed to be achievable through crossbreeding. It was thus concluded that, the level or extent of on-going and planned crossbreeding programs/projects in the various countries would have a big impact on AnGR, especially local ones, in the immediate and in the long term time perspectives. The management practices adopted for AnGR at herd level, and to some extent country level, would depend on the extent which crossbreds are used.

Level of investments in crossbreeding

To determine the level of investments made by countries on crossbreeding, each country was requested to indicate whether the country had made significant investments, and had undertaken initiatives to import and use exotic AnGR, and what had been the results and impacts of the investments and initiatives. It was deduced from the results that the relatively large number of exotic breeds in countries was likely a reflection on the magnitude or extent to which Governments had supported or encouraged the importation and use of exotic breeds. This view was supported by the finding that of the 40 countries which provided information on investments and initiatives in support of importation and use of exotic breeds by their governments, as high as 37 or 93% of the countries reported such investments and initiatives had taken place in their countries. The high percentage of countries which had made investment was thought to reflect the importance the countries attach to, and believe in this aspect of AnGR management. Thus, it was concluded from the

discussions on the status quo, or rise, or decrease, in the proportions of exotics/crossbreds relative to indigenous AnGR populations in countries will continue to be important, as the proportions at any particular time are a factor in determining the future outlook on the composition of AnGR in a country.

Setting the policy agenda

The Agenda setting for policy discussions, formulation and the communication of the policies should include:

Advice on the advantages and disadvantages of crossbreeding

Before the introduction of any crossbreeding programme, all aspects of the production system should be analysed. Agricultural and land use policies, market information and access, environmental conditions, characteristics of animal populations and infrastructure available are examples of such aspects to be analysed. Knowledge of the breed resources available and the strengths and weaknesses of each breed should guide decisions of what breeds to use in a crossbreeding programme.

Planning and decisions making

Carefully planned interventions are required to ensure that breed development takes place with a clear understanding of the local conditions and the comparative advantages of the different genotypes considered for use and development. Producers should plan crossbreeding strategies carefully and have reasonable expectations of the process. First crosses, the F1s, may involve easy decisions, but another decision would need to be made, when first cross calves reach sexual maturity. What breed of service sire will be used on the F1s would need to determined. Two years later, the next generation of crossbred female would be reaching breeding age and another decision must be made.

Recording and identification

To maintain a beneficial crossbreeding system, regardless of the number of breeds, it is essential to follow systematic breeding strategies consistently. It is important to only have unrelated and competitive breeds along with unique and permanent identification of all individual animals and their ancestry. It is also important to use progeny tested and highly ranked AI bulls continuously.

Infrastructure and capacity/expertise

Establish/strengthen facilities for ex-situ conservation of local AnGR materials inter alia; selection of donor individuals, sampling size, inbreeding considerations, genetic relationships, quality evaluation, and storage technologies and methodologies.

Development of new synthetic breeds

Crossbreeding can be used for upgrading to new breeds or be used as an intermediate step when creating new synthetic breeds. The formation of new synthetic breed types based on a multi-breed foundation is an attractive alternative to traditional crossbreeding systems. New synthetic breed types are based on mating among crossbreds of two or more breeds. Once a composite breed is formed, it can be managed as a purebred in a pasture system with none of the problems associated with small herd size or fluctuation in breed composition.

Issuing regulation for controlling movement and exchange of animal genetic materials

Elimination of policy barriers and the establishment of policies that support the development of local breeds and all production systems are desirable. The primary focus of this policy is on increasing livestock productivity and production in a sustainable manner, while protecting the environment, preserving animal bio-diversity, ensuring bio-security and farmers' livelihood. There is emphasis on increased productivity, profitability, institutional support and services apart from provisions of appropriate risk mitigation measures. The Policy should facilitate better regulation of export and import of animal genetic materials and conservation of indigenous breeds, which are essential in the development of livestock sector.

POLICY OPTIONS AND RECOMMENDATIONS

Policy options to resolve some of the outstanding issues and making crossbreeding less of a curse to the management of African AnGR include:

- Governments take deliberate actions to positively control and plan crossbreeding in ways that would have more positive outcomes. Well planned systematic crossbreeding programs with defined end products can be an opportunity for an economically viable use of the pure-bred local parental breed. Structured crossbreeding will result in stabilized composites breeds. It will increase the breed diversity allowing for access to a wide range breeds that provide varied products.
- Technical experts and technocrats in the service of Governments and parastatals establish guidelines that promote the active participation of the producers and other stakeholders in the formulation and management of the crossbreeding programs, and further ensure that the producers have access to technical assistance, adequate supplies and support services for the management of their herds.
- Governments and their Agencies responsible for AnGR development and management should have mechanisms and protocols in place that assess the suitability of exotic AnGR in the different production systems they are intended for, prior to their wide-spread use; develop collaborative breeding programs for both local and exotic breeds

and their crosses.

- In addition to African Governments and Legislative bodies establishing policies and legislation to control introduction of exotic AnGR, governments should initiate and develop policies for achieving increased production. Specific policies for crossbreeding, dealing with indiscriminate introduction and use of exotic breeds, and other intensification methods such as feeding systems and animal health and delivery systems, should be covered in legislations and policies.
- Deliberate and well-funded awareness programs should be created and promoted by relevant Agencies of Governments on the risks associated with unplanned crossbreeding. Farmer's and decision maker's knowledge and awareness will be improved so as to meet the constraints in breeding, management and health aspects and the level of perception on adoption of crossbred will be increased. Awareness on the limitations of exotic breeds and a shift from short-term oriented production increases to a more long-term oriented development recognizing the multiple roles and values of local AnGR in low to medium external input production systems would be raised.

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